

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2015/2016

BIS3124 – SEMINAR IN INVESTMENT

(All sections / Groups)

3 JUNE 2016

3.00 P.M.- 5.00 P.M.

(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 5 pages. There are a total 4 questions.
2. Answer **ALL** questions.
3. Marks are shown at the end of each question.

Answer all questions in the answer booklet provided.

QUESTION 1 (25 marks)

(a)

Sentiment analysis on social media for stock movement prediction

1. Introduction

Stock price forecasting is very important in the planning of business activity. However, building an accurate stock prediction model is still a challenging problem. In addition to historical prices, the current stock market is affected by the mood of society. The overall social mood with respect to a given company might be one of the important variables which affect the stock price of that company. Nowadays, the emergence of online social networks makes available large amounts of mood data. Therefore, incorporating information from social media with the historical prices can improve the predictive ability of models.

The goal of our research is to develop a model to predict the stock price movement (whether the price will be up or down) using information from social media (Message Board). In our proposed method, a model that predicts the stock value at t using features derived from information at $t-1$ and $t-2$, where t stands for a transaction date, will be trained by supervised machine learning. Apart from the mood information, the stock prices are affected by many factors such as microeconomic and macroeconomic factors. However, this research only focuses on how the mood information from social media can be used to predict the stock price. We will mainly aim at extracting the mood information by sentiment analysis on social

media data. Then, these sentiments will be integrated into a model to predict stocks. To achieve this goal, discovering the topics and sentiments in a large amount of social media is very important to get the opinions of investors. However, sentiment analysis on social media is difficult. The text is usually short, contains many misspellings, uncommon grammar constructions and so on. In addition, the literature shows conflicting results in sentiment analysis for stock market prediction. Some researchers report that sentiments from social media have no predictive capabilities (Antweiler & Frank, 2004; Tumarkin & Whitelaw, 2001), while other researchers have reported either weak or strong predictive capabilities (Bollen, Mao, & Zeng, 2011). Therefore, how to use opinions in social media for stock price predictions is still an open problem.

One contribution of this paper is that we propose a novel feature 'topic-sentiment' to improve the performance of stock market prediction. It is important to recognize what topics are discussed in social media and how people feel about these topics. The 'topic-sentiment' feature, which represents the sentiments of the specific topics of the company (product, service, dividend and so on), are used for prediction of stock price movement. This feature is obtained in two ways: by using the existing topic model called the joint sentiment/topic model (JST) and by our own proposed method. The extracted topics and sentiments in the former method are hidden (latent), whereas not hidden in the latter. To the best of our knowledge, this is the first research trying to extract topics and sentiments simultaneously and utilize them for stock market prediction. Another contribution is a large scale evaluation. The effectiveness of the sentiments in social media in stock market prediction is still uncertain because a

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(Source: Nguyen et al. (2015) Sentiment analysis on social media for stock movement prediction, 42, 9, 9603–9611)

- (i) From the above information, identify the statement of problem from the study. (5 marks)
- (ii) What is the main objective of the study? Do you agree that sentiment effect could impact stock return? (5 marks)

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- (b) Over the past 50 years, efficient market hypothesis is the fundamental finance theory to explain stock return. How do you understand market efficiency? However, market efficiency failed to explain market anomalies, including financial crises and speculative bubble and excess volatility. The growing information flow over the channels such as over the internet and social media, had also made it difficult for investors to monitor every piece of information. Behavioral finance emerges to explain market inefficiency. What is behavioral finance? Why is it important to understand different theories/concepts in investing? (15 marks)

QUESTION 2 (25 marks)

(a)

Table II
Regression Results of Fama and French Three Factor Model
 (January 2003 to December 2012)
 Three Factor Model: $R_p - R_f = a_p + b_p (R_m - R_f) + S_p \text{ SMB} + h_p \text{ HML} + e_p$

<i>Three Factor Model</i>						
<i>Portfolios</i>	<i>a_p</i>	<i>b_p</i>	<i>S_p</i>	<i>H_p</i>	<i>Adj.R²</i>	<i>D.W</i>
BH	-1.5746	0.8476	-0.2657	0.7824	0.77	2.40
T-ratio [P.V]	2.59[0.01]**	9.59 [0.00]*	-3.06 [0.00]*	6.34 [0.00]*		
BM	-0.0876	0.9589	-0.1690	0.1234	0.75	2.01
T-ratio [P.V]	-0.1 [0.86]	18.75 [0.000]*	-2.33 [0.02]**	1.90 [0.05]*		
<i>Three Factor Model</i>						
<i>Portfolios</i>	<i>a_p</i>	<i>b_p</i>	<i>S_p</i>	<i>H_p</i>	<i>Adj.R²</i>	<i>D.W</i>
BL	-0.6853	0.9071	-0.2750	-0.3513	0.74	2.11
T-ratio [P.V]	-1.46[0.14]	14.26 [0.000]*	-4.15 [0.00]*	-5.95 [0.00]*		
SH	-0.1727	0.9280	0.9068	0.6140	0.80	2.23
T-ratio [P.V]	-0.3 [0.70]	14.89 [0.000]*	13.96 [0.00]*	10.61 [0.00]*		
SM	-1.1128	0.9169	0.4670	0.1926	0.63	1.97
T-ratio [P.V]	-2.06 [0.04]**	12.55 [0.00]*	6.13 [0.00]*	2.84 [0.00]*		
SL	-1.0620	0.8685	0.9162	-0.3022	0.58	2.26
T-ratio [P.V]	-1.7 [0.09]**	9.01 [0.000]*	8.84 [0.00]*	-3.19 [0.00]*		

Source: Author's Computation, (2014) with E-view 7.0 [Appendix II]

NB: *, ** & *** represent significance at 1%, 5% and 10% respectively

(Source: Osamwonyi & Ajao (2014). An application of the Fama and French three factor model in the Nigerian stock market. Indian Journal of Economics & Business, Vol 13, No. 3, 341-361)

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Note: The six (6) intersecting portfolios, namely: SL, SM, SH, BL, BM and BH are explained as follows.

SL: Consists of all stocks in the small market equity group that are also in the low BE/ME group.

SM: Consists of all stocks in the small market equity group that are also in the medium BE/ME group.

SH: Consists of all stocks in the small market equity group that are also in the high BE/ME group.

BL: Consists of all stocks in the big market equity group that are also in the low BE/ME group.

BM: Consists of all stocks in the big market equity group that are also in the medium BE/ME group.

BH: Consists of all stocks in the big market equity group that are also in the high BE/ME group.

where BE/ME = book equity/market equity

- (i) Explain the three important factors determining the stock return under Fama-French three factor model. (6 marks)
 - (ii) What is the advantage of the Fama-French three factor model? (4 marks)
 - (iii) Based on Table II above, explain the effect of SMB and HML on the expected stock return of the six portfolios. Do the results consistently with Fama-French three factor's findings? (12 marks)
- (b) Define the additional two variables modelled in Fama-French five factors model. (3 marks)

QUESTION 3 (25 marks)

- (a) Discuss on fusion investing. Value investing is part of the fusion investing. Discuss the limitation in value investing. (7 marks)

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(b) Answer the following questions.

Table 2
Global responsible investments as of year-end 2011 (GSIA, 2013).

Country/region	Size of responsible investments (in billion US dollar)	Responsible investments as a percentage of total assets under management
Japan	10	0.2
Asia, ex Japan	64	2.9
Australia & New Zealand	178	18.0
Africa	229	35.2
Canada	589	20.2
United States	3740	11.2
Europe	8758	49.0

(Source: Scholtens (2014). Indicators of Responsible Investing. Ecological Indicators, 36, 382–385)

- (i) Based on the record of global responsible investment 2011, comment on the country distribution of responsible investment. (6 marks)
- (ii) What is social responsible investing? (6 marks)
- (iii) From your opinion, can social responsible funds outperform that of conventional funds in the long run? (6 marks)

QUESTION 4 (25 marks)

- (a) “An efficient market is defined as a market where there are large numbers of rational, profit ‘maximisers’ actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants. In an efficient market, competition among the many intelligent participants leads to a situation where, at any point in time, actual prices of individual securities already reflect the effects of information based both on events that have already occurred and on events which, as of now, the market expects to take place in the future. In other words, in an efficient market at any point in time the actual price of a security will be a good estimate of its intrinsic value” (Fama, 1970).

Based on the above statement, what are the critics over efficient market hypothesis? (10 marks)

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(b) Answer the following questions based on the extract news below.

BBC NEWS

15 February 2016

Why use negative interest rates?

By Andrew Walker, BBC World Service Economics correspondent

Interest rates are now negative, below zero, for a growing number of borrowers, mainly in the financial markets. It means in effect they are being paid to borrow someone else's money. So what on earth is going on?

Perhaps the first thing worth stating is that negative interest rates are probably not coming to a High Street near you in the near future.

It is a phenomenon that has had economists scratching their heads. In fact there is a well-known (to economists) term for the idea that interest rates shouldn't go below zero. It's the "zero lower bound".

It has been breached. There is probably a limit to how much further we can go in that direction. But at the very least recent developments show the zero lower bound is not as rigid as it was widely thought to be.

One point worth spelling out is that we are not talking about negative real interest rates. That is where you have an interest rate that may be above zero but it is lower than inflation. That means that a borrower's total repayments have less purchasing power than the amount they first borrowed.

That is not so unusual. As long as there is at least moderate inflation, central banks can get real rates below zero to stimulate economic recovery and there have been many episodes of that.

No. We are talking here about what economists call nominal interest rates below zero, making no allowance for rising (or falling) prices.

The reason it is so strange is this: normally a potential lender can choose not to lend and just sit on the funds. That is equivalent to getting a nominal interest rate of zero. Not great, but surely better than an interest rate of less than zero. That is the basic idea behind the concept of the zero lower bound.

So why do we have negative rates at all?

Explain why the central banks of Denmark, Sweden, Switzerland and Japan decided to have a negative rate on banks' excess funds held on deposit at the central bank. What are the positive sides of negative interest rate? What are the concerns? (15 marks)

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